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INFLATION IN PAKISTAN - AN EMPIRICAL ANALYSIS

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Introduction

The world experienced a rampant inflation during the seventies and Pakistan is no exception to that. During the sixties inflation in Pakistan averaged around three percent but during the seventies inflation rate accelerated and has remained in two digit in most of the years; the rate was as high as twenty-five percent during 1974[1]. Though the rate of inflation has considerably slowed down since 1974 to only eight percent in 1977-78, yet in the very recent years inflation rate has once again risen sharply, it was twelve percent during 1979-80.

Inflation is a very complex phenomenon and it is quite difficult to disentangle the effects of various impulses on inflation. Excessive monetary expansion, demand for wage increases delinked from productivity, sectoral imbalances created during the process of development especially the supply constraints of essential products, use of monopoly power to push prices well above the cost of production etc. are some of the factors which can result in high rates of inflation.

While inflation is result of a number of factors simultaneously working through the economy, the economists are divided into various groups in explaining inflation. On the one hand the moneterists argue that inflation is due to an excessive growth of money supply, and as such controlling the money supply is the best policy for combating inflation. On the other hand the structuralists reject the moneterist

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[1] Consumer Price Index was even higher, it was 27% during 1974-75 and has remained higher than the wholesale price index and GNP deflator until 1978-79 except for the year 1976-77.

explanation of inflation and argue that though inflation can also be due to financial disorders but basically it is due to economic and social maladjustments arising in the process of economic development.

In this paper we shall explore determinants of inflation and in particular we shall examine the importance of monetary and structural variables in the inflation experienced by Pakistan during the period 1960-78. The plan of the study is as follows. Section 1 briefly reviews Pakistan's experience of inflation during 1960-78 period. The conceptual framework to study inflation in Pakistan is reported in section II, while the data and methodological problems are discussed in Section III. Regression results are reported in Section IV, policy implications are suggested in Section V while conclusions are reported in Section VI.

I. INFLATION IN PAKISTAN

Inflation may be measured by movements in the consumer price index, the wholesale price index or the index of GNP deflator. The consumer price index for West Pakistan is not available for the years prior to 1971. Therefore, we have to use either the wholesale price index or the GNP deflator as a measure of inflation. However, we may note that except for one or two years the three indexes move fairly close as shown in Table I.

By international standards inflation in Pakistan has been moderate during sixties. As in shown in table II it averaged around three percent. During the sixties only in 1966-67 inflation rate was as high as 9.27 percent. The sharp increase in inflation rate in 1966-67 was mainly due to an increase in government expenditure, slowdown of P.L-480 imports,

Table I

Inflation Rates in Pakistan: 1970-71 - 1978-79

Years	Rate of increase in consumer price	Rate of increase in wholesale price	GNP deflator
1970-71	5.71	6.15	5.16
1971-72	4.69	4.70	6.28
1972-73	9.69	15.78	15.62
1973-74	30.00	32.78	22.35
1974-75	26.73	23.66	25.35
1975-76	11.66	8.58	14.11
1976-77	9.24	11.27	7.78
1977-78	6.89	6.32	2.68
1978-79	8.33	6.74	6.79

Table II

Inflation rate in Pakistan: 1959-60 to 1970-71

Year	Rate of increase in wholesale price	Rate of increase in GNP deflator
1959-60	-	-
1960-61	4.77	3.82
1961-62	-0.12	-1.61
1962-63	-1.71	-0.14
1963-64	3.38	5.13
1964-65	6.78	4.44
1965-66	-1.34	2.75
1966-67	11.00	9.27
1967-68	1.32	2.00
1968-69	2.81	0.36
1969-70	2.04	3.91
1970-71	5.99	5.16

increased defence expenditures, rehabilitation of war displaced persons etc. as an aftermath of the Indo-Pakistan war in 1965.

Up to 1971-72, the increase in prices was moderate but in 1972-73 the prices increased sharply by 15.62 percent as is shown in table I. The inflation rate went on increasing till 1974-75 when it reached the peak rate of twenty-five percent. From then onwards it has shown a declining trend and has fallen consistently to fourteen percent in 1975-76 and to seven percent in 1978-79. The rate of inflation over 1959-60 to 1970-71 and 1971-72 to 1978-79 are shown in table I and II.

II. CONCEPTUAL FRAMEWORK OF THE MODEL

In order to study inflation we have drawn heavily on earlier work done for both developed and developing countries by Harberger [5], Vogel [17], Iyoha [6, 7] and Akhtar [2]. The first two studies are purely moneterist in the sense that any persistent increase in money supply relative to the growth of output is sufficient to generate inflation. Iyoha has tested the relationship between openness of the economy and the rate of inflation in both the developed and developing countries, while Akhtar has tested the monetary and structuralist models separately and jointly for India and Philippines.

The hypothesis that inflation is only due to an excess of money supply expansion over the growth of output may be tested by the following relation.

$$P_t = \alpha_0 + \alpha_1 M_t + \alpha_2 M_{t-1} + \alpha_3 Y_t + \alpha_4 Y_p + \alpha_5 P_{t-1}$$

where

P_t = Rate of inflation

M_t = the annual percentage change in money supply[2]

Y_t = Percentage changes in the GNP

Y_p = Percentage changes in the real income

P_{t-1} = Rate of inflation lagged by one year.

Besides the excess money supply we have included lagged prices as one of the independent variables, because if inflation persists, expected price increases will lead to higher claims for income and hence further increase in prices. Lagged inflation rates are used as a proxy for expected inflation rate. The growth of GNP is expected to have a negative relation with the inflation rate because increases in the availability of goods and services should reduce the excess demand.

Contrary to the moneterist's belief it is quite difficult to control money supply in the developing countries due to structural problems. Moreover changes in money supply cannot be isolated from the fiscal actions of the government. Thomas Sargent and Neil Wallace [16], Robert Barro [3], Rodney Jacob [8] and Jacob Frenkel [4] have shown that fiscal actions of the government significantly affect the money supply which leads to an increase in inflation rate. On the other hand the increase in inflation rate through increase in government expenditures at current prices well above the increase in revenue leads to higher money supply. Similarly, Akhtar [2] has tested fiscal policy

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[2] We have used the narrow definition of money (M_1) i.e. currency in circulation plus demand deposits.

variables and foreign trade variables separately in the structuralist model to show that changes in fiscal policy are an important determinant of inflation rate.

It is argued that budget deficits lead to higher prices by creating excess demand for goods and services. Apart from the deficits, the development and non-development expenditures contribute to inflation while the public investment would contribute to inflation to the extent it increases the total expenditure, while it will have a dampening effect on inflation to the extent it adds to productive capacity. Similarly, private investment by increasing expenditures also contribute to inflation, though to the extent private investment adds to the productive capacity, inflation is expected to be dampened.

$$P_t = \alpha_0 + \alpha_1 D_t + \alpha_2 K_t + \alpha_3 S_t + \alpha_4 T_t$$

where

P_t = rate of inflation

D_t = annual budget deficit

K_t = private investment

S_t = Non-development expenditure

T_t = Public investment

The structuralists believe that while monetary and fiscal variables are important they are not the basic cause of inflation. The inflation largely due to structural factors. According to the structuralists inflation is essentially cost push. Higher cost of import substitution, deterioration of terms of trade and exchange rate devaluations are the main factors giving rise to increase in the costs of production.

It is argued that due to inelastic world demand for primary products the terms of trade for the LDC's have deteriorated over time. Consequently exports of the developing countries do not grow sufficiently to finance their increasing import requirements. Moreover, primary goods form a bulk of exports from developing countries foreign exchange earnings are unstable and as such when exports fall, in order to bring about equilibrium between imports and exports either the currency will be devalued or imports will be restricted through tariffs and quotas[3]. These measures lead to an increase in import prices which, both directly and indirectly lead to inflation. Moreover, increase in prices of imports induces import substitution which leads to further increase in prices. The extent to which foreign trade influences domestic inflation rate depends on a number of factors such as price elasticity of local demand, scope for import substitution in favour of cheap sources, pricing policies of import distributing and retailing sectors and government intervention through variations in exchange rate, tariff structure and retail prices.

An increase in export prices will directly affect the domestic prices of exported goods especially if a major portion of these exportables is also consumed at home. Increase in export prices lead to higher incomes of the producers and traders which increases the aggregate demand. The increase in aggregate demand is not necessarily matched by an instantaneous increase in supply. Moreover, to the extent increase in aggregate expenditure leads to more intensive capacity utilization, the prices may increase due to an increase in cost in domestic wages and prices. This can result in wage-price spiral of a structural nature.

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[3] These measures are necessary because the foreign exchange reserves of the developing countries are generally quite small.

Therefore, according to the structuralists, inflation rate is a function of absorption capacity, import and exports i.e.

$$P_t = \alpha_0 + \alpha_1 A_t + \alpha_2 X_t + \alpha_3 M_t$$

where

P_t = rate of inflation

A_t = absorption capacity

X_t = unit value index of exports

M_t = unit value index of imports

As noted in the introduction, inflation is a complex phenomenon which arises due to monetary, fiscal and structural variables. The studies which consider some of the factors in isolation from the others are not going to be very useful. Therefore, we though at first consider the three models separately, finally analyse the three types of factors jointly.

III. DATA SOURCES AND METHODOLOGY

As said earlier, inflation may be measured by consumer price index, wholesale price index or GNP deflator. The consumer price index (CPI) is the most accepted index of inflation but unfortunately for the pre-1971 war period we do not have a CPI for West Pakistan. However, the results are not expected to be affected much as teh CPI, the WPI and the GNP deflator for all Pakistan move very closely[4]. We have used GNP deflator as a measure of inflation because it is a more comprehensive indicator of inflation then the WPI, which has been obtained on the basis of GNP at current and constant factor cost obtained from Pakistan

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[4] Further, the WPI and the GNP deflator as dependent variables given similar results.

Economic Survey 1978/79 [12]. Because quarterly data are not available, the analysis is carried on the basis of annual data for the period 1960/61 to 1977/78.

We have used narrow definition of money supply i.e. currency plus demand deposits (M_1). These estimates have been obtained from Kemal, Bilquees and Khan [9]. Budget defecit is defined as revenue minus the non-development expenditure. For the period 1959/60 to 1970/71 the revenue receipts for West Pakistan (now Pakistan) are the share of the Central direct taxes collected from West Pakistan as given in Budget-in-Brief 1970/71 [13]. "Other revenue receipts" of the federal budget which are not available separately for the two provinces, seventy percent of the receipts have been allocated to West Pakistan. Since no breakdown of the Federal non-development expenditure is available, seventy percent of these have been attributed to West Pakistan. Data for 1971/72 to 1977/78 have been taken from the Pakistan Economic Survey for the year 1977/78 [12]. Data for investment are taken from Report of consistency committee on Third Five Year Plan [15] and Evaluation of the Third Five Year Plan 1965-70 [14]. Absorption capacity is defined as total expenditures over GNP and the data have been taken from Pakistan Economic Survey. Data on trade balance has been adjusted for the inter wing trade. The unit value indexes of exports and imports have been taken from the twenty-five years of Statistics in Pakistan [11] and Pakistan Economic Survey.

Our analysis encompasses the period of 1959/60 to 1977/78. However, in 1971 separation of East Pakistan resulted in a very different production structure. Moreover, after 1971 inflation rates

have been significantly higher than those in the sixties, therefore, we may have a structural shift around 1971. In order to account for the possible structural change, we have used covariance analysis to test the difference in intercepts and slopes.

IV. RESULTS

We have first estimated the relationship separately between inflation and monetary, fiscal and trade variables and then these variables have been simultaneously related to inflation. In table IV we present the estimates of the moneterist model. The analysis has been done sequentially. First we introduce money variables and GNP. Then alternately permanent income and lagged prices are introduced. Finally all the variables are included in the specification.

When we have m_t, m_{t-1} and y_t in the specification both current and lagged money supply are significant but only at 90% level and are positively related to inflation. The significant coefficient of lagged money supply shows that effect of money supply on inflation spreads beyond the current period. These results conform to Harberger's results for Chile, where he found that inflation is affected by money supplies in both the current and the preceeding year. While money supply has correct sign and also significant, though at 90% level, the relationship between current permanent income and inflation turns out to be positive which is theoretically absurd.

Inclusion of lagged prices as additional variable leads to a perverse sign of the coefficient of m_t and to insignificant coefficient of current income. Lagged prices are highly significant. The positive relationship between inflation and lagged prices would be due to lagged

TABLE IV

ESTIMATED COEFFICIENTS OF THE MONETARY MODEL

	Constant	m_t	m_{t-1}	Y_t	Y_p	P'_{t-1}	R^2	F F	DW
1.	-3.009 (-0.670)	0.279 (1.607)	0.246 (1.550)	0.393 (0.766)	--	--	0.420	3.381	1.036
2.	-2.856 (-0.603)	0.280 (1.318)	0.254 (1.489)	0.332 (0.518)	0.071 (0.172)	--	0.421	2.372	1.019
3.	-0.971 (-0.241)	0.089 (0.482)	0.119 (0.789)	0.233 (0.513)	--	0.554 (2.286)	0.594	4.610	1.532
4.	-0.211 (-0.052)	-0.034 (-0.158)	0.140 (0.933)	-0.113 (-0.234)	0.391 (1.062)	0.649 (2.523)	0.622	3.951	1.473

Figures in parentheses are t-values

b/*

TABLE V

ESTIMATED COEFFICIENTS OF MONETARY MODEL BY ANALYSIS OF COVARIANCE

	Constant	M_t	M_{t-1}	Y_t	Y_p	P'_{t-1}	D_a	D_{mt}	D_{mt-1}	D_{yt}	D_{yp}	$D_{p't-1}$	R^2	F	DW
1.	3.065	-0.009	0.233	-0.174	-	-	-0.138	0.627	-0.101	1.863	-	-	0.669	2.883	1.381
	(0.657)	(-0.311)	(0.326)	(-0.313)			(-0.903)	(1.186)	(-0.390)	(1.526)					
2.	1.879	-0.118	0.310		-0.099		-1.980	0.251	-0.074	-	1.153		0.731	3.847	1.916
	(0.716)	(-0.323)	(1.195)	-	(-0.234	-	(-0.245)	(0.652)	(-0.324)		(1.792)	-			
3.	3.741	-2.602	0.426	-0.169	-	-0.303	2.476	-1.101	-0.958	0.539	-	2.368	0.884	6.749	2.909
	(1.145)	(-1.113)	(2.032)	(-0.456)		(-0.803)	(1.657)	(-1.836)	(-3.388)	(0.518)		(3.450)			
4.	2.977	-0.274	0.588	0.043	-0.259	-0.481	2.176	-1.378	-0.954	-1.835	0.991	2.394	0.942	8.818	2.759
	(1.007)	(-1.240)	(3.085)	(0.100)	(-0.690))	-1.430)	(1.777)	(-2.525)	(-4.031)	(-1.196)	(1.951)	(4.124)			

Figures in parentheses are t-values.

adjustment in the rate of inflation to changes in money supply and income, or to expectation based on the past behaviour of the prices. Lagged price may well be capturing the effect of structural variables which are omitted in this model, but to that we shall come back later.

Covariance analysis in which we have accounted for the structural change in 1971 leads to a significant improvement in the results. These results are reported in table V. Lagged money supply is the most significant explanatory variable followed by lagged prices during 1960-71 period. However, during 1971-78 period lagged prices are the most significant explanatory variable[5].

Disregarding the money variables and concentrating on just fiscal policy yields quite interesting results reported in table VI. It is interesting to note that fiscal model explain relatively more variation in prices than does the monetary model. Non-development expenditure current or lagged by one year, are positively related to inflation. Public investment bears a negative sign and is highly significant but the private investment is positively related to inflation though significant only at 90% level. Another strange result is that the budget defecits are negatively related to inflation though it can be argued that other variables like non-development expenditure and private investment which are mainly responsible for budget defecits capture its effect.

Covariance analysis leads to some improvement in the results. These results are reported in table VII. Private investment is negatively related to the rate of inflation, while the non-development expenditure is

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[5] m_{t-1} is highly significant at 99.05% level but it bears incorrect sign.

TABLE VI

ESTIMATED COEFFICIENTS OE FISCAL MODEL

Const-ta nt	D_t	K_t	S_t	T_t	R^2	F	DW
6.017 (1.958)	-0.001 (-0.625)	-0.002 (-1.016)	0.001 (1.763)	-	0.583	6.543	1.248
-0.265 (-0.076)	-0.004 (-2.829)	0.004 (1.620)	-	-0.0006 (-0.868)	0.517	5.001	1.627
2.524	-0.0008	-0.0006	0.003	-0.002	0.752	9.881	2.258

Const-ta nt	D_{t-1}	K_{t-1}	S_{t-1}	T_{t-1}	R^r	F	DW
4.525 (1.252)	-0.0004 (-0.233)	-0.0006 (-0.259)	0.007 (0.842)	-	0.265	1.681	0.738
0.859 (0.245)	-0.002 (-1.171)	0.003 (1.434)	-	-0.0006 (-0.821)	0.263	1.666	0.963
3.536 (1.370)	0.0006 (0.435)	-0.0008 (-0.450)	0.004 (3.847)	-0.004 (-3.838)	0.655	6.181	1.715

Figures in parentheses are t-values.

b/*

TABLE VII

ESTIMATED COEFFICIENT OF FISCAL MODEL BY ANALYSIS OF COVARIANCE

Constant	D_t	K_t	S_t	T_t	D_a	DD_t	DK_t	DS_t	DT_t	R^2	F	DW
0.185	-0.0004	-0.004	0.004	-	9.816	-0.001	0.0003	-0.002		0.829	6.954	2.1
(0.051)	(-0.187)	(-1.852)	(2.111)		(1.499)	(-0.515)	(1.738)	(-1.589)				
-0.949	-0.001	0.0001	-	0.001	9.390	-0.003	0.002	-	-0.001	0.739	4.057	2.047
(-0.161)	(-0.381)	(0.743)		(0.566)	(1.152)	(-0.764)	(1.330)		(-0.509)			
0.486	-0.0002	-0.003	0.004	-0.0004	5.700	-0.001	0.0003	-0.001	-0.0003	0.836	4.532	2.342
(0.091)	(-0.086)	(0. 909)	(1.125)	(-0.129)	(0.555)	(-0.424)	(1.61)	(-0.377)	(-0.933)			

Constant	D_{t-1}	K_{t-1}	S_{t-1}	T_{t-1}	D_a	DD_{t-1}	DK_{t-1}	DS_{t-1}	DT_{t-1}	R^2	F	DW
1.006	-0.0006	-0.004	0.004	-	0.284	0.005	-0.003	-0.002	-	0.906	13.880	2.318
(0.574)	(-0.408)	(1.409)	(1.856)		(7.220)	(2.122)	(-0.947)	(-1.001)				
0.741	-0.001	0.0003	-	0.0009	0.485	0.005	-0.013	-	-0.002	0.878	10.372	2.132
(0.327)	(-0.576)	(0.229)		(0.617)	(4.071)	(1.855)	(-2.460)		(0.911)			
1.470	-0.0002	-0.004	0.005	-0.0006	35.80	0.004	-0.005	-0.004	0.002	0.908	8.833	2.320
(0.649)	(-0.102)	(-1.330)	(1.603)	(-0.396)	(0.415)	(1.288)	(-0.206)	(-0.465)	(0.148)			

Figures in parentheses are t-values.

positively related. The two coefficients are significant at 90 and 95 percent level respectively during 1960-71. Private investment and inflation are positively related during 1972-75, though significant only at 90% level. We feel that the perverse signs are largely due to specification errors to which we will come back in the later section.

Table VIII reports the relationship between foreign trade sector and rate of inflation disregarding monetary, fiscal and investment variables. When all the variables are related to current year they are all insignificant. However, when they are lagged by one year they are significant. In the final equation taking all the variables simultaneously we see that imports and absorption bear a negative sign and are insignificant at 90% level. However, exports are highly significant at 99.95% level and are positively related to inflation. The negative sign of absorption capacity implies that capital inflow increases the domestic availability of goods and services and has a dampening effect on the price level in the preceeding year. Similarly imports have eased the domestic inflationary presures by increasing the flow of goods[6]. Negative sign of imports and absorption capacity together imply that our absorption is greater than GNP, and imports are taken careof by the absorption capacity variable.

The positive relationship between exports lagged by one year and inflation could be attributed to a number of factors. For example, where exported goods are also directly consumed in the home market increase in world market prices result in an equal increase in the domes-

[6]When imports is the only variable it bears a positive sign. Similarly when we regress absorption and imports, the imports continue to bear positive sign. However, when we drop absorption and include exports, imports bear a negative sign significant at 90% level. This may be due to specification errors.

Table VIII

Estimated Coefficients of Foreign Trade Model

Constant	A_t	X_t	M_t	R^2	F	DW
0.390 (0.879)	-30.73 (-0.731)	-	-	0.032	0.534	0.618
35.106 (0.845)	-32.42 (-0.813)	0.026 (4.140)	-	0.540	8.734	1.149
46.92 (1.16)	-44.80 (-1.126)	-	0.017 (4.212)	0.540	9.038	1.092
1.148 (0.595)	-	0.013 (6.607)	0.005 (0.274)	0.520	8.135	0.906
42.39 (1.246)	-38.87 (-1.215)	0.003 (0.189)	0.013 (0.668)	0.566	6.087	1.148

Constant	A_{t-1}	X_{t-1}	M_{t-1}	R^2	F	DW
5.842 (0.938)	0.787 (0.129)		-	0.001	0.017	0.537
2.027 (1.099)	-	0.024 (3.203)	-	0.391	10.257	0.842
3.205 (1.774)	-		0.014 (2.606)	0.298	6.794	0.845
5.255 (0.976)	-2.205 (-0.455)		0.014 (2.556)	0.306	3.302	0.791
5.109 (1.027)	-3.397) (-0.669)	0.026 (3.204)	-	0.403	5.176	0.740
1.076 (0.557)		0.064 (2.091)	-0.027 (-1.345)	0.457	6.307	1.039
5.234 (1.099)	-4.666 (-0.955	0.006 (2.219)	-0.029 (-1.437)	0.490	4.485	0.933

Figures in parentheses are t-values.

tic prices of these products. Exports affect inflation rate indirectly as well, increase in prices lead to an increase in aggregate demand, and supply does not adjust instantaneously, thus, leading to a rise in prices.

Covariance analysis does not improve the results in any significant way as may be seen from Table IX.

Before proceeding to the estimation of the relationship incorporating all the three types of variables let us summarise the results so far discussed. We shall focus our discussion on covariance results. Monetary model explains 94 percent, fiscal model explains 91 percent and pure trade model explains 81 percent variation in the inflation rate. In the moneterist model, while lagged money supply is the most significant variable during 1960-71, lagged prices is the most significant variable during 1972-78. Similarly in the fiscal model private investment and non-development expenditures are the main contributing factors to inflation during 1960-71. These are the current private investment and lagged budget defecit which are positively related to inflation which are significant during 1972-78 period. It may further be noted that lagged private investment is negatively related to inflation during 1972-78. Absorption capacity, exports and imports all lagged by one year are significant explanatory variables for the period 1972-78, but during 1960-71 non of these variables is statistically significant.

The above analysis clearly suggest that all the models have some truth as each of them is capable of explaining a significant amount of variations in the inflation rate. It is primarily this reason which has

TABLE IX

ESTIMATED COEFFICIENTS OF FOREIGN TRADE MODEL BY ANALYSIS OF COVARIANCE

Constant	A_t	X_t	M_t	D_α	DA_t	DX_t	DM_t	R^2	F	DW
2.701 (0.043)	0.315 (0.005)	-		-22.4 (-0.263)	30.18 (0.374)	-	-	0.585	6.58	1.375
50.100 (-0.392)	-	-	0.068 (0.632)	14.38 (1.05)	-	-	-0.063 (-0.584)	0.600	6.99	1.237
-5.342 (-0.269)	-	-0.078 (-0.423)	-	14.20 (0. 693)	-	-0.070 (-0.038)	-	0.595	6.85	1.305
-42.54 (-0.464)	31.69 (0.414)	-	0.101 (0.721)	63.57 (0.383)	-43.67 (-0.270)	-	-0.095 (-0.067)	0.605	3.69	1.195
-51.00 (-0.435)	35.22 (0.396)	0.157 (0.559)	-	53.75 (0.370)	-28.98 (-0.232)	-0.149 (-0.531)	-	0.600	3.601	1.294
-0.135 (-0.005)	-	-0.106 (-0.254)	0.122 (0.503)	9.014 (0.372)	-	0.112 (0.266)	-0.122 (-0.495)	0.603	3.650	1.182
-38.807 (-0. 297)	29.45 (0.301)	-0.024 (-0.44)	0.116 (0.413)	46.76 (0.217)	-28.51 (-0. 143)	0.029 (0.056)	0.110 (-0.404)	0.607	2.205	1.185
Constant	A_{t-1}	X_{t-1}	M_{t-1}	D_α	DA_{t-1}	DX_{t-1}	DM_{t-1}	R^2	F	DW
4.073 (1.145)	-0.820 (-0.234)	-	-	0.011 (2.17)	-95.28 (-1.974)	-	-	0.719	11.943	1.615
2.339 (0.684)	-	-	0.008 (0.287)	18.14 (3.425)	-	-	-0.002 (-0.710)	0.714	11.633	1.794
2.999 (0.778)	-	0.002 (0.74)	-	14.40 (2.279)	-	-0.013 (-0.341)	-	0.656	8.908	1.533
3.383 (1.047)	[illegible]	-0.226 (1.247)	0.204 (1.282)	0.137 (2.597)	-	0.266 (1.461)	-0.239 (-1.594)	0.790	9.312	1,83
3.871 (1.107)	-10.21 (-0.746)	-0.068 (-0.241)	0.149 (0.808)	-12.85 (-0.104)	36.69 (0.293)	0.112 (0.391)	-0.189 (-1.016)	0.806	5.964	1.710

ked to so many partial explainations of inflation which consider some but disregard other variables. As a result none of these explainations is satisfactory. It may also be pointed out that because of mis-specifications we get perverse signs of absorption capacity, GNP, non-development expenditure and private investment. Therefore, these variables must be considered simultaneously, and as can be seen from table X simultaneous consideration leads to a considerable improvement in the explaination of inflation.

When all the variables are included in the specification and none of the variables is lagged, public investment, absorption capacity and imports turn out to be highly significant. When we lag all the variables by one year, results improve.[7] Money supply and private investment are significant at 99% level and are positively related to inflation. Adjustment of inflation to changes in money supply occur with one year's lag. Public investment continues to show a dampening effect on inflation Exports and imports are positively related to inflation and are significant at 97.25% level. It comes out that a simultaneous consideration of all the variables shows considerable improvement in the results and brings out clearly the most important variables. However, it is not possible to test for the structural shift in the final analysis because covariance analysis is not possible due to limited number of observations.

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[7] Only two equations incorporating all the variables are reported in the table. In other regressions different specifications of these variables using current and lagged variable simultaneously, were tried. Because they generally yielded results similar to the regressions reported above they have not been included here.

TABLE- X

ESTIMATED COEFFICIENTS OF THE THREE MODELS COMBINED

Constant	m_t	Y_t	P_{t-1}	D_t	K_t	S_t	T_t	A_t	X_t	M_t	R^2	F	DW
-0.753	0.222	0.085	-0.069	0.002	0.004	-0.0003	-0.004	63.40	0.001	0.085			
(-1.470)	(1.348)	(0.218)	(-0.256)	(1.015)	(1.362)	(-0.258)	(-3.028)	(1.432)	(0.032)	(2.330)	0.905	6.715	2.548

Constant	m_{t-1}	Y_{t-1}	P_{t-2}	D_{t-1}	K_{t-1}	S_{t-1}	T_{t-1}	A_{t-1}	X_{t-1}	M_{t-1}	R^2	F	DW
3.956	0.617	0.214	-0.316	0.00004	0.006	-0.003	-0.003	-15.59	0.058	0.048			
(2.582)	(6.143)	(0.777)	(-1.607)	(0.420)	(5.759)	(-2.135)	(-8.815)	(-5.966)	(3.88)	(3.396)	0.971	26.206	2.935

Figures in parentheses are t-values

Policy Implications

Inflation is a complex phenomenon and therefore it can only be checked by a concerted effort on the part of the government. There is no short-cut to the solution of controlling inflation such as suggested by the moneterists: Control the money supply and inflation is contained. This paper brings out quite clearly that though money supply is an important factor in determining inflation rate, yet, it is only one and not necessarily the most important factor. We can rank the factors in order of their importance in explaining inflation rate by Standardized Betas. The ranks and nature of relationship between various explanatory variables and inflation rate is shown in table XI. The table shows that in order of importance money supply is preceeded by private and public investment and imports.

Because of limited number of observations we were unable to use covariance analysis when all the variables were incorporated into the model. Therefore in interpreting the results we shall consider the results of covariance analysis done separately for each model and especially where covariance analysis lead to a shift in sign.

Our study has very clearly shown that there are structural problems facing the Pakistan economy which must be taken into consideration for formulating a policy package to combat inflation. The degree of openness determines the extent to which imported inflation can lead to higher prices in Pakistan. It may be noted that imports rank only after public investment in explaining the inflation and that explains dependence of inflation rate on the inflation rate in the world market. As our import bill rises, the transmission of foreign inflation into

Pakistan rises as well. It follows than that Pakistan cannot completely eliminate inflation, and we can only hope with concerted efforts to contain inflation in reasonable limits.

Table XI

Results of the Standardized Betas

Variables	Ranks	Relationship with Rate of Inflation
Public Investment	1	(Negative)
Imports	2	(Positive)
Private Investment	3	(Positive)
Money Supply	4	(Positive)
Absorption Capacity	5	(-Negative)
Lagged Prices	6	(Positive)
Real Income	7	(Positive)
Budget Deficit	8	(Positive)
Non-Development Expenditure	9	(Positive)
Exports	10	(Positive)

In order to ensure that the domestic policies do not aggravate the problem of imported inflation we have to monitor monetary and fiscal policies very closely. Of course we must control money supply but can we control money supply by disregarding fiscal policy? Since budget defecits would directly lead to higher money supply, monetary policy without being couched in terms of fiscal policy will not be very effective. Therefore, we have to review our policies regarding non-development expenditures, public investment and the budget defecit,

a reduction in the non-development expenditures would improve the budgetary position and hence the money supply.

It is important to note that because of the significant effect expected inflation has on the inflation rate, the concerted effort at combating inflation would bear fruit only over a relatively longer period. Because of the history of inflation rate, expectation of higher prices will be revised only gradually. Stag-flation has been the main issue during the seventies. Obviously the way out is to channelise the resources into more productive uses.

From the preceeding analysis it is obvious that fiscal policy has to play a crucial role. Not only budgets have to be properly managed, but the tax structure should also be altered in such a way that it has built in incentives for savings and more productive use of capital. When fiscal policy is pursued properly, the monetary policy will also play an effective role.

The present study excludes the effects of wages and home remittance on the rate of inflation and these are important omissions. It is very well known that increase in wages exceeding increases in productivity will lead to inflation. The inflation can be both cost push and demand pull. However due to non-availability of adequate data, we have been unable to include wage increases as one of the explanatory variables. Similarly, because of the paucity of good data on remittances we had to omit this variable as well.

Conclusions

In this paper we have analyzed both the moneterist and structuralist models of inflation and have come to the conclusion that both the models are capable of explaining significant amount of variations in inflation rates. However, though both the moneterist and structuralist models explained higher degree of variations in inflation, yet they are not satisfactory as signs of a number of co-efficient were wrong. Moreover because both the models explain large variations the both type of variables could be important. Therefore we integrated the moneterist and structuralist models and saw that not only R^2 improved but the signs were also correct in most of the cases. It follows therefore that exclusive reliance on either of the two models would entail a specification error and each of them would yield biased estimates of the parameters.

That the inflation is a complex phenomenon may be seen from the fact that ten variables are statistically significant in explaining inflation in Pakistan. Most of the variables are related to fiscal policy which underscore the importance of government revenues and spending in inflation rate. Money supply is also one of the most important variables but it cannot be controlled effectively unless the fiscal policy is in line with the monetary policy. The degree of openness of the economy, expected prices and the growth rate of GNP are the other main explanatory variables.

We may conclude that inflation can only be contained to a level of imported inflation by pursuing a vigrous fiscal policy accompanied by monetary policy. However these policies are not expected to yield immediate results because unless the expectations regarding inflation rate are revised, and the revisions take time, inflation would not be significantly affected.

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